REMARKS

The field of plasma display panels has drawn a significant amount of competitive interest as consumers become increasingly interested in relatively large high-definitional television sets. As television screens have increased to 40+ inches in size, the thin, relatively lightweight characteristics of a plasma display panel has gained increased acceptance in the marketplace. The demands, however, of a high-definitional TV require smaller pixel sizes, while the distance between the discharge electrodes decreased, and the discharge space becomes smaller. It is necessary, however, to provide sufficient luminescence to the individual cells to maintain the picture quality. These requirements, of course, must be accomplished within the economic constraints of a highly competitive marketplace.

A number of highly skilled engineers and scientists have been attempting to address these issue in this environment, and the patentability of the present claims must be considered accordingly.

> Thus when differences that may appear technologically minor nonetheless have a practical impact, particularly in a crowded field, the decision-maker must consider the obviousness of the new structure in this light.
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> *Continental Can Co. USA Inc. v. Monsanto Co.*,
> 20 USPQ 2d 1746, 1752 (Fed Cir. 1991).

The Office Action rejected Claims 1-7 as being unpatentable over a combination of the *Watanabe et al.* Japanese Laid-open Application 11-106237 (U.S. Patent No. 6,010,973) in view of the *Kopatz et al.* (U.S. Patent No. 4,715,878). *Watanabe et al.* was the basic "teaching" reference and it recognized that screen mesh printing leaves marks and bubbles on a dielectric glass layer and frequently requires multiple steps. The *Watanabe et al.* taught a green sheet method to resolve the problems of screen printing in order to have a smooth surface and a

uniform coating thickness. The issues of bubbles were purportedly addressed by controlling 50 percent of the particle diameters of the glass powder to be 2.0μm. Additionally, the glass particles that are utilized are formed from a glass composition for the respective samples A, B and C, as shown in Table 1.

The glass powder was formed and subsequently crushed, pieces were then classified into various groups of glass powders depending on the distribution of the particle sizes. See Column 7, Lines 29-42. Other than defining maximum particle diameters, there is clearly no teaching in the *Watanabe et al.* reference to utilize the specific dielectric glass materials of the present invention, nor to provide a spheroidizing step to uniformly modify the ground dielectric glass material into an optimum geometric configuration in relationship to the desired thickness of the fired dielectric glass layer. These features and improvements are defined not only in the original claims but also in the newly drafted claims provided herein. Thus, while the *Watanabe et al.* reference attempts to address problems of surface irregularity, and bubbles in a green sheet method of forming a dielectric layer, it does not recognize nor offer the solutions set forth in the present invention.

The Office Action recognized these deficiencies of the *Watanabe et al.* reference and relied upon the *Kopatz et al.* (U.S. Patent No. 4,715,878) to purportedly address these issues. The *Kopatz et al.* reference, however, is not addressing the unique requirements of a plasma display panel, but rather merely defines a process for producing small size glass particles wherein at least half by weight of the particles are formed into droplets.

Applicant respectfully submits that the incentive for seeking the spheroidal glass particles taught in the *Kopatz et al.* reference can only be derived from our specific teachings and in hindsight of the present application. Certainly the principal reference, *Watanabe et al.*, which is

in the field of plasma display panels and is actually addressing a bubble issue that occurs in screen printing a dielectric glass layer neither recognizes nor offers the solution of the present invention. The only reason that a hypothetical person of ordinary skill in this field would cite the *Kopatz et al.* reference is by use of the teaching of our present application for the sole purpose of seeking to cure the deficiency of the principal reference.

In establishing a prima facie case of obviousness, it is incumbent upon the Examiner to provide a reason why one of ordinary skill in the art would have been led to modify a prior art reference or to combine reference teachings to arrive at the claimed invention. See *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Int. 1985). To this end, the requisite motivation must stem from some teaching, suggestion or inference in the prior art as a whole or from the knowledge generally available to one of ordinary skill in the art and not from an appellant's disclosure. See, for example, *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1052, 5 USPQ2d 1434, 1439 (Fed. Cir.), cert. denied, 488 U.S. 825 (1988).

The present invention solves a very specific problem in a relatively crowded art by creating an environment in which glass particles of a specific configuration are spheroidizing and subsequently converting each particle of the ground dielectric glass material such that the maximum diameter of these spheroidal particles will not exceed one half of the desired thickness of the dielectric glass layer after it is fired.

The present invention was reached only after a careful evaluation and experiments in determining the actual effectiveness of various conditions, including the types of dielectric glass material that would be used, the methods of spheroidizing, and the conditions for the firing. These features are set forth in our presently pending claims. For example, the temperature for firing should enable a uniform burnout rate for the binder. By using spheroidal glass particles,

the binder will have a uniform thickness that can be addressed by the temperature. The temperature applied, however, is close to the softening point of the glass particles so that the binder will burn out before the particles melt and, additionally, the molten glass paste will not have an opportunity to react with the discharge electrodes, which could create a further unwanted formation of bubbles. Thus, bubbles associated with the burnout of the binder and bubbles associated with the reaction with the metal electrodes are carefully avoided in following the procedures of the present invention. As set forth in Table 1 of our specification on Page 26, by reducing the number of bubbles per centimeter square of area, a relatively high breakdown voltage can be accommodated.

In summary, even though the *Kopatz et al.* reference teaches that spheroidal glass particles existed in 1987, it is clear that the *Watanabe et al.* reference of 11 years later neither recognized nor implemented such a teaching to address specifically the problems of a dielectric glass layer in a plasma display panel. Thus, the critical requirement of a teaching reference is clearly missing that justifies the 35 U.S.C. § 103 rejection.

Even if hypothetically combined, it would still not be possible to teach the parameters of the present invention because the composition of the glass material for the dielectric glass layer and its actual method of formation were only derived by experimental work of the present inventors and cannot be derived by any theoretical approach. As such, the direction to even seek the teaching of the *Kopatz et al.* reference would not be available to a person of ordinary skill, including the inventors of the '973 *Watanabe et al.* reference.

As noted, this is a highly competitive field with limitations on both cost and performance that have been addressed by a number of highly skilled engineers and scientists, yet the cited prior art failed to provide this teaching reference to render obvious the present invention.

It is believed that the presently pending claims in view of the above comments more than adequately distinguish over the cited art, and an early notification of allowance is requested. If the Examiner believes that a telephone interview will help further the prosecution of this case, he is respectfully requested to contact the undersigned attorney at the listed telephone number.

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on February 5, 2004.

By: James Lee

Signature

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Very truly yours,

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